Grantee: Intelligent Energy Systems
Project Name: Small Community Self-Regulating Grid

Grant and Project# 7310049 / 413011

Grant Completion Report

Background:

Increased numbers of communities are using non-firm energy such as wind power to provide some energy. Wind power can vary substantially minute to minute so that energy supplied to a community may exceed the community demand. Housing electric heaters could increase demand (by radio controllers) when energy supply is high thus regulating load and displacing heating oil.

Activities:

Intelligent Energy Systems (IES) installed electric thermal storage stoves controlled by radio from the power plant control system in 28 houses. If the community electric system frequency increases the stoves come on. If frequency decreases the stoves turn off.

Project Costs:

	Budget	Expenditures
Grant:	$465,634	$465,634
Match:	$20,000	$20,000
Total:	$485,634	$485,634

Project Outcomes:

Project operated for several years showed wind energy being converted to the thermal storage stoves. Fuel savings by electric stoves in 2016 (assume $6/gal diesel) were $9,000. However, other considerations in determining economics:
Electric boiler receives less energy so a facility may be using more heating oil,
Electric system average frequency decreased. The decrease in the community average frequency may have impacts on various electrical equipment not determined,
Effect on residential usage and power cost equalization must be determined.

Problems Encountered:

Conclusions and Recommendations:

Usage of energy by radio controlled heaters not into heat and impacts on community electronics needs investigation before economics can be determined. A quicker acting control may help the system maintain frequency.